

Strategic Plan for FM Standards Development

Background

Facility Management Requirements

Facilities Management (FM) is the requirements definition, planning, programming, design, acquisition, operations, maintenance, revitalization, evaluation, and disposal of assets which include land, water, airspace, industrial equipment, buildings, structures and utilities. FM is governed by the laws and regulations that define the managerial responsibilities which require a comprehensive approach to effectively manage these assets.

General Requirements are to ensure the effective and economical use of America's real property and public land assets. This should be accomplished through use of consistent federal policies and standards that address the acquisition, management, and disposal of properties. The importance of Facilities Management standardization is to assist with and assure management accountability reporting for federal real property management. Based on the 80 plus laws and regulations departments and agencies should recognize the importance of managing such resources through increased management attention and standardization. Federal regulations require that all departments and agencies establish internal policies and systems of accountability that ensure effective use of real property in support of mission-related activities. Facilities Management standards should be consistent with Federal policies regarding the acquisition, management, and disposal of such assets.

Current regulations require all agencies to periodically review their real property holdings and conduct surveys of such property in accordance with standards and procedures determined by the Administrator of General Services. Regulations also direct that all agencies shall develop annual real property management improvement plans that include clear and concise goals and objectives related to all aspects of real property management, and identify sales, work space management, productivity, and excess property targets to be turned back over to the Private sector.

The regulations state that agencies through the management and budget review processes shall work toward achieving government-wide property management policies that can achieve savings. Through the results of improved management, Federal spending can be reduced while supporting stated mission program delivery. FM standardization initiatives shall seek to improve Federal real property management through the adoption of appropriate private sector management techniques and seek to remove and eliminate the duplication of effort among agencies. These standards shall support the establishment of managerial accountability for implementing effective and efficient real property management practices.

The FM standards should, to the extent permitted by law, provide government-wide policy oversight and guidance for federal real property management. The standards need to provide a consistent information base that can support management of selected properties, support creditable surveys across agencies, and allow delegation of operational responsibility across multiple agencies where feasible and economical.

Center Role in FM

The primary role for the Center in shaping the direction of Facility Management for the U.S. DOD and our Federal Agency partners has been focused on developing and promoting CADD, GIS and other Facilities Management related standards. The Center has also fulfilled a

significant role providing guidance and technical assistance on CADD/GIS and related technologies to the installation/infrastructure communities.

The two major standards initiatives accomplished by the Center have been the development of the Spatial Data Standards for Facilities, Infrastructure, and Environment (SDSFIE) and the CADD/GIS Technology Center AEC CADD Standard. The two major standards initiatives accomplished by the Center have been the development of the Spatial Data Standards for Facilities, Infrastructure, and Environment (SDSFIE) and the architectural, engineering, and construction (A/E/C) CADD Standard. The A/E/C CADD Standard is part of an initiative to consolidate existing CADD drafting standards into a format generic enough to operate under various CADD software packages (such as MicroStation® and AutoCAD®) and to incorporate existing industry/national standards. The A/E/C CADD Standard includes presentation graphics, level/layer assignments, electronic file naming, and standard symbology. This standard is widely recognized within the DoD and is now compliant with the 1999 release of the U.S. National CAD Standard. The A/E/C CADD Standard enhances the baseline requirements set by the National CAD standard by adding DoD-specific requirements not typically required by the U.S. construction industry.

The SDSFIE Standard, an implementation of the FGDC standard, has been developed by The CADD/GIS Technology Center to provide a robust single geospatial feature schema and dictionary. The standard is a consolidation of existing GIS/spatial data standards, including National Spatial Data Infrastructure (NSDI) standards, into a single, coherent, generic schema. This standard is accompanied by a set of software tools that can automatically generate SQL code or database tables to construct a physical geospatial database schema for various relational database software (e.g., Oracle, Microsoft Access, SQL Server, and Informix) to be used in conjunction with commercially available GIS software packages. This standard is becoming the defacto standard for spatial schema for many installations/facilities and small municipalities and is the basis for an American National Standard Institute (ANSI) standards project.

The Center has also developed other standards and guidelines, such as a manual to provide guidance and recommended procedures for the preparation of *Commerce Business Daily* (CBD) announcements and contract provisions for use in acquiring the services of architect-engineer (A-E) firms to prepare and deliver CADD generated products. A similar manual was prepared to provide guidance and recommended procedures for the preparation of CBD announcements and contract provisions for use in acquiring the services of A-E and consulting firms to acquire and deliver geospatial data and related products in a digital format readily usable by geospatial data systems.

The reuse of existing construction details among agencies can reduce CADD design/drafting effort per detail sheet from 15 hours to approximately 5 hours or less. With this in mind, the CADD Details Library, a collection of over 1500 generic construction details in both AutoCAD .dwg and MicroStation .dgn formats, was developed to provide details from the following disciplines: HTRW/Environmental, Civil/Site, Landscape Architectural, Structural, Interior Design, Fire Protection/Suppression, Mechanical, Electrical and Telecommunications. A utility called the CADD Details Manager, which allows the user to preview and scale a detail, prior to insertion into a drawing, has also been developed.

The Center has performed some initial work on the development of a Facility Management Standard (FMS). The FMS standard project has thus far focused on the development of the non-graphic FM “business” entities and attributes in support of Facility Management (FM) at Air Force, Army, and Navy installations, and Army Corps of Engineers

Civil Works activities. The FMS provides a standardized database format and structure for "business", event, and temporal data (e.g., inspections, repairs). These FMS related data elements are related (linked) to specific SDSFIE geospatial features and/or A/E/C CADD objects.

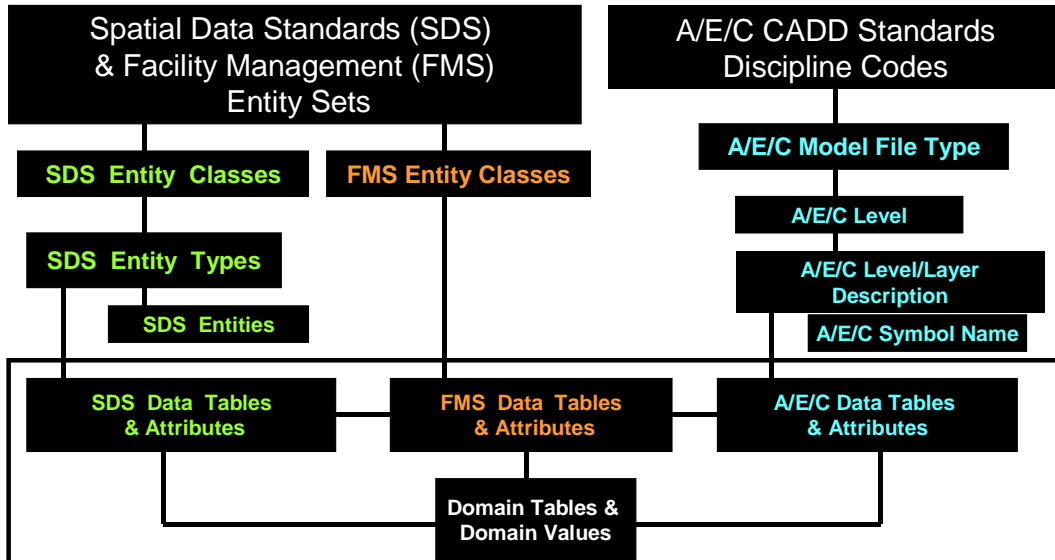
The Center has recently completed a study on Space Management for the purpose of defining data standards for building space. The scope of work to be performed for this task includes: 1)the research and evaluation of selected existing Space Management data models and criteria; 2)the development of existing data model comparisons; and 3)the development of a recommended Space Management Standards data model for incorporation into the Spatial Data Standards (SDS)/Facility Management Standards (FMS), and/or A/E/C CADD Standards, graphic data models (entity types/entities) and FMS nongraphic (attributes & domains) data model.

A survey of the various types of Computer Aided Facility Management (CAFM) software used by Department of Defense (DoD) organizations for facility management was conducted as a part of the CADD/GIS Technology Center's FMS effort. The Atlantic Division, Naval Facilities Engineering Command (LANTDIV), conducted the survey and prepared the report for the Center. The goal was to examine the software types in use at various Department of Defense installations, collect/analyze data, and to prepare a report of these findings.

The Center is actively involved with the International Alliance for Interoperability (IAI) Facility Management (FM) Domain Group. The FM Domain Group focuses on providing direct management of facilities by developing extensions to the Industry Foundation Class (IFC) building model which will be standardized throughout major disciplines. Several domain projects have been completed during the past two years to address Facility Management and development; the most recent of these is the move management process.

Cost effective procedures and tools are currently be developed for integrating CADD-based drawings/details construction information (in the A/E/C CADD Standards format) into a GIS-based operations/facility management system (in the SDS format). It is a goal of the Center to provide an integrated standard relational database structure for the CADD, GIS, and FM communities.

CADD/GIS/FM Standards Data Model



CADD/GIS/FM Standards Compliant Database = One Integrated Relational Database Structure

Purpose and Scope

The Strategic Plan provides overall guidance for developing and managing graphic and non-graphic data standards for Facility Management. This plan establishes the shared vision for FM by outlining the goals, and associated objectives and strategies to accomplish the standardization of FM data.

The FM Standards will consist of a relational database schema and data dictionary for data describing the control and reporting of real property and derived entities that must be considered in its use. This will be defined by the Core Focus Areas (asset management, civil works programs, land management and conservation services) and Associated areas (operations area support, public safety, and communications support).

Facilities Management Standards Overview

Assets Management

Utilities
Real Property Planning
Real Property Maintenance
Training

Land Areas

Environmental
Agricultural
Conservation

Civil Works

Waterways
Flood Control
Land Management

Public Safety

Force Protection
Fire & Safety

Communications

Telephones
Radio
Cable

Operations Areas

Port Facilities
Industrial
Engineering
Air Operations

The Asset Management focus area includes utilities (water treatment, sewage treatment, electrical power generation, utility lines, and fuel storage and distribution systems), real property (real property planning, space management, public works management, facility plans and engineering, range management, forestry management and lease management), **real** property maintenance (facility repair and maintenance, road maintenance, equipment maintenance, landfill and waste management, grounds maintenance) and training.

The Land Areas focus area includes integrated training area management, natural resource management, historical and archaeological management, and recreational area management, environmental compliance (pollution prevention, compliance assessment and monitoring, HAZMAT control and other compliance related activities, agricultural and conservation (soil conservation, farmland rehabilitation, crop management, watershed and flood prevention operations, water quality management, water conservation, fish and wildlife management and other conservation oriented programs).

The Civil Works focus area includes waterway (harbor and river) programs (locks, dams, revetments, harbor and river dredging, and recreational facilities), flood control programs (levees, floodwalls and reservoir construction), and land reclamation and irrigation programs.

The Public Safety focus area includes HAZMAT, crash and rescue, weather, emergency response routes, disaster preparedness, and fire protection.

The Communications focus area includes communications infrastructure, cable management, telephone and radio.

The Operations focus area includes inventory information related to Air Facility Operations, including fuel support, T-line/airfield facilities, ground electronics, crash and rescue, weapons housing, cargo handling, passenger terminal operations, airfield logistics, auxiliary airfield support, radar, communication, ground-based navigational aids, automation, and radios used to facilitate communication between air traffic controllers and pilots; port facilities, including berthing and hotel services, port logistics, tugs and crafts, degaussing, sea air rescue, spill response, and weapons support; and industrial engineering support, including equipment and repair, maintenance, utilities.

Strategic Direction for FMS

Mission Statement. The Mission Statement is a statement of the CADD/GIS Technology Center's rationale for existence in terms of who it serves, what it does for them, and how it is done. The Center's mission focus is on functioning as a coordination center relying on other capabilities throughout DOD and the federal, state and local governments for the accomplishment of specific tasks and application developments where appropriate. This includes setting standards, promoting system integration, supporting centralized acquisition, and providing assistance for the installation, training, operation, and maintenance of CADD/GIS and facilities management (FM) systems. This also includes directing specific application developments, promoting communications, developing and promoting standards, furnishing technical advice, interfacing with professional organizations and industry, evaluating technological developments, and recommending necessary CADD/GIS and FM policy to insure the maximum benefits are received from these technologies. This organization will also serve as the Federal Geographic Data Committee (FGDC) Working Group on Facilities, Infrastructure and the Environment, actively supporting the National Spatial Data Infrastructure (NSDI).

Vision. The Vision Statement is a description of the organization a number of years in the future, stated in present tense. The Vision Statement captures the imagination of the organization to accomplish the missions and tasks which all believe to be beneficial and critical to the success of the organization.

A FM vision, which captures the objectives and direction of the group with respect to facility management standards, should be aligned with the organization's overall mission. The FM vision of the Center is to:

“facilitate the sharing of information through national data standards and the use of government and/or commercial tools and services, thereby improving facility management business practices.”

Goals, Objectives, and Strategies. Goals describe areas of major change. Each goal statement is followed by a description of objectives and strategies. Objectives characterize broad actions needed to pursue each goal, while strategies characterize specific actions needed to accomplish each objective. Objectives and strategies should not necessarily be accomplished in chronological order. Many objectives and strategies are paralleling, not sequential in nature.

Goal 1. The standard should foster joint cooperation and collaboration between governments and industry that will allow interoperability.

Objective 1.1. Develop a working relationship with commercial FM vendors and integrators to ensure that the standard will be used with commercial products

Strategy 1.1.1. Attend symposiums, conferences, user group meetings of commercial vendors.

Strategy 1.1.2. Invite representatives of commercial vendors/integrators to demonstrate their FM solutions.

Objective 1.2. Encourage and solicit support of commercial vendors in adopting FM Standards as their default data model.

Strategy 1.2.1. Sponsor and participate in meetings between FM government and industry groups

Strategy 1.2.2. Provide presentations on the FM standard at commercial user conferences.

Objective 1.3. Ensure consistency with other National and International Standards

Strategy 1.3.1. Periodically evaluate existing standards

Strategy 1.3.2. Incorporate selected data elements of existing standards.

Objective 1.4. Coordinate FM Standards development with other standards development organizations.

Strategy 1.4.1. Invite other development bodies to the Symposium

Strategy 1.4.2. Form a joint Center & Industry working group

Objective 1.5. Enable data interoperability between commercial FM technologies (for example CADD, GIS, CMMS, CAFMS)

Strategy 1.5.1. Periodically evaluate existing commercial data models.

Strategy 1.5.2. Incorporate or link to selected data elements of existing commercial data models.

Goal 2. The standard should be customer driven, flexible, modular, and maintainable

Objective 2.1. Ensure FM standard meets the needs of the facilities, infrastructure, and environmental communities.

Strategy 2.1.1. Sponsor periodic meetings of technical experts to assist Center.

Strategy 2.1.2. Provide alpha and beta versions of the standard to the FIE community for review and comment.

Strategy 2.1.3. Sponsor and/or participate in FM Symposia for the entire FIE community.

Objective 2.2. Stay abreast of current and future CADD/GIS/FM technological developments.

Strategy 2.2.1. Investigate the feasibility of an object-oriented model

Strategy 2.2.2. Attend CADD/GIS/FM-related symposiums, conferences, user group meetings.

Objective 2.3. Utilize centralized configuration management

Strategy 2.3.1. Provide periodic updates of FM Standards.

Strategy 2.3.2. Formalize the process for updating and changing the standard.

Objective 2.4. Ensure users are proficient at using the FM standards

Strategy 2.4.1. Provide training in use of FM Standards

Strategy 2.4.2. Develop "User-Friendly" utilities to assist customers in use of standards.

Goal 3. The Standard should promote consistency within the Center's Facilities, Infrastructure, Environmental standards

Objective 3.1. The FM standard must be aligned with existing SDSFIE and AEC CADD Standards (short-term).

Strategy 3.1.1. Perform periodic correlation analyses.

Strategy 3.1.2. Develop a plan of action and milestones for aligning the FIE standards.

Strategy 3.1.3. Incorporate or link to selected data elements

Objective 3.2. Consolidate SDSFIE, AEC CADD Standards and FM standards.
(long-term)

Strategy 3.2.1. Provide a published systematic approach to consolidation

Strategy 3.2.2. Propose annual standard projects to support the approach

Strategy 3.2.3. Develop one Facilities, Infrastructure, Environmental standard.

Objective 3.3. Promote benefits of using the standard.

Strategy 3.3.1. Sell the Return on Investment

Strategy 3.3.2. Publish success stories on the Center Web page

Objective 3.4. Facilitate effective communications among users

Strategy 3.4.1. Establish a interactive user group on line

Strategy 3.4.2. Maintain database of Users

Strategy 3.4.3. Investigate more effective means to receive and respond to customer feedback.

Goal 4. The standard should provide a framework which supports asset management, civil works and land management (focus areas).

Objective 4.1. Provide the capability to capture temporal data.

Strategy 4.1.1. Identify time-sensitive data required for legal reporting.

Strategy 4.1.2. Identify time-sensitive data required for decision making.

Strategy 4.1.3. Identify time-sensitive data required for operations

Objective 4.2. Maintain an efficient FIE model that defines the scope of FM focus and associated areas (operations area support, communications support, public safety).

Strategy 4.2.1. Publish a structure of the data model of the focus areas and the associated areas

Strategy 4.2.2. Prioritize specific focus areas for accomplishment

Strategy 4.2.3. Establish and update development schedule

Objective 4.3. Develop a transactional relational data model which will support multi-user environments with large user bases.

Strategy 4.3.1. Migrate the existing model to support the life cycle.

Strategy 4.3.2. Modify the existing relational model to support transactions.

Goal 5. The standard should provide support for Life Cycle management process (From Planning to Disposal)

Objective 5.1. Incorporate the commercial approach of just-in-time delivery.

Strategy 5.1.1. Identify time-sensitive data required for operations.

Objective 5.2. Define and publish major activities of Life Cycle Management

Strategy 5.2.1. Provide access to data based on workflow timing.

Objective 5.3. Facilitate the data transfer between activities of life cycle management.

Strategy 5.3.1. Identify the data associated with the workflow.

Objective 5.4. Identify data requirements for FM data standards

Strategy 5.4.1. Identify legal reporting requirements.

Strategy 5.4.2. Identify data requirements associated with Agency regulations